

DENON AVR/AVC control protocol

Ver. 3.7

Application model : AVR-4802R

Application terminal : RS-232C

Connector specification

Connector type : DB-9pin female type, slave straight connection (DCE type)

(1pin : GND , 2pin : TxD , 3pin : RxD , 5pin : Common(GND) , 4,6,7,8,9pin : NC)

Communication format :

Synchronous system	: Tone step synchronization
communication system	: A half duplex
Communication speed	: 9600bps
Character length	: 8 bits
Parity control	: None
Start bit	: 1 bit
Stop bit	: 1 bit
Communication procedure	: Non procedural
Communication data length	: 135 bytes (maximum)

Protocol specification

The following three data forms is defined.

- COMMAND** : The message sent to a system(AVR/AVC) from a controller(Touch Panel etc.)
A command to a system is given from a controller.
- EVENT** : The message sent to a controller(Touch Panel etc.) from a system(AVR/AVC)
The result is sent, when a system is operated directly and a state changes.
*The form of **EVENT** presupposes that it is the same as that of **COMMAND**.
Refer to the following table for the contents of **COMMAND and **EVENT**.
- RESPONSE** : The message sent to a controller(Touch Panel etc.) from a system(AVR/AVC)
if the 'request command' (**COMMAND**+?**CR**(0x0D)) has came from a controller.
The **RESPONSE** should be sent within 200ms of receiving the **COMMAND**.
*The form of **RESPONSE** presupposes that it is the same as that of **EVENT**.

Basic specification : The command by ASCII CODE, parameter expression

*ASCII CODE which can be used is from 0x20 to 0x7F : the alphabet and the number of 0-9 , and space (0x20) , Some signs ,
AND carriage return(0x0D)--- It is used only as a pause sign.

Command structure : **COMMAND** + **PARAMETER** + **CR**(0x0D)

COMMAND : ASCII CODE of 2 characters

ex. **SI** : Select Input source
 MS : surround Mode Setting
 MV : Master Volume setting
 PW : system PoWer setting

PARAMETER : ASCII CODE (up to 25 characters)

ex. **DVD** : function name
 CDR/TAPE-1 : function name
 THX SURROUND EX : surround mode name
 SUPER STADIUM : surround mode name

*Special Parameter--- ? : for request command

The example of a command * <CR> is the meaning of 0x0D.

SIDVD<CR> : Select Input source DVD

MSTHX SURROUND EX<CR> : surround Mode Set to THX SURROUND EX

MVUP<CR> : Master Volume UP

PWON<CR> : system PoWer ON

PWSTANDBY<CR> : system PoWer STANDBY

SI?<CR> : Request command for now playing input source >> Return **RESPONSE** 'SI***<CR>'

Others

- A) **COMMAND** is receivable also during transmission of **EVENT**.
- B) Since CHANNEL VOLUME changes simultaneously when the SURROUND MODE changes, the value of the channel volume of all channels returns as **EVENT**.
- C) CHANNEL VOLUME returns the data of ALL channels by the present SURROUND MODE also including an intact channel. In this case, the data of an intact channel is set to "50".
- D) Since SURROUND MODE changes simultaneously when the INPUT source changes, the SURROUND MODE (and also the value of the channel volume of all channels , It described in B)) returns as **EVENT**.
- E) When SURROUND MODE is the same in between INPUT source change before and after, **EVENT** of SURROUND MODE and CHANNEL VOLUME does NOT return.
- F) Although **EVENT** of SURROUND MODE returns when the present SURROUND MODE is set up again, CHANNEL VOLUME does NOT return.
- G) When SURROUND MODE is changed, before returning SURROUND MODE after change as **EVENT**, the present SURROUND MODE is returned.
- H) The **RESPONSE** should be sent as opposed to the request command by all the commands with which an **EVENT** exists , not need to the another request commands(ex. SV command).
- I) The **PARAMETER** (with **COMMAND** and **RESPONSE**, **EVENT**) of minimum level of MASTER VOLUME and MULTI ZONE defines "99".

COMMAND and PARAMETER list

COMMAND	PARAMETER	function	example
PW	ON	POWER ON/STANDBY change	PWON<CR>
	STANDBY		PWSTANDBY<CR>
MV	UP	MASTER VOLUME UP/DOWN , direct change to ***dB ** : 00 to 99 by ASCII 98=+18dB(MAX), 80=0dB, 99=---(MIN)	MVUP<CR>
	DOWN		MVDOWN<CR>
	**		MV80<CR>
CV	FL UP	CHANNEL VOLUME UP/DOWN , direct change to ***dB	CVFL UP<CR>
	FL DOWN	---FRONT Lch	CVFL DOWN<CR>
	FL **	** : 38 to 62 by ASCII , 50=0dB	CVFL 50<CR>
	FR UP		CVFR UP<CR>
	FR DOWN	---FRONT Rch	CVFR DOWN<CR>
	FR **	** : 38 to 62 by ASCII , 50=0dB	CVFR 50<CR>
	C UP		CVC UP<CR>
	C DOWN	---CENTERch	CVC DOWN<CR>
	C **	** : 38 to 62 by ASCII , 50=0dB	CVC 50<CR>
	SW UP		CVSW UP<CR>
	SW DOWN	---SUBWOOFERch	CVSW DOWN<CR>
	SW **	** : 38 to 62 by ASCII , 50=0dB	CVSW 50<CR>
	SL UP		CVSL UP<CR>
	SL DOWN	---SURROUND Lch	CVSL DOWN<CR>
	SL **	** : 38 to 62 by ASCII , 50=0dB	CVSL 50<CR>
	SR UP		CVSR UP<CR>
	SR DOWN	---SURROUND Rch	CVSR DOWN<CR>
	SR **	** : 38 to 62 by ASCII , 50=0dB	CVSR 50<CR>
	SBL UP	---SURROUND BACK Lch (SBch 2SP)	CVSBL UP<CR>
	SBL DOWN		CVSBL DOWN<CR>
	SBL **	** : 38 to 62 by ASCII , 50=0dB	CVSBL 50<CR>
	SBR UP	---SURROUND BACK Rch (SBch 2SP)	CVSBR UP<CR>
	SBR DOWN		CVSBR DOWN<CR>
	SBR **	** : 38 to 62 by ASCII , 50=0dB	CVSBR 50<CR>

COMMAND	PARAMETER	function	example
CV	SB UP	---SURROUND BACKch (SBch 1SP)	CVSB UP<CR>
	SB DOWN		CVSB DOWN<CR>
	SB **	** : 38 to 62 by ASCII , 50=0dB	CVSB 50<CR>
MU	ON	OUTPUT MUTE ON/OFF change	MUON<CR>
	OFF		MUOFF<CR>
SI	PHONO	Select INPUT source	SIPHONO<CR>
	CD		SICD<CR>
	TUNER		SITUNER<CR>
	DVD		SIDVD<CR>
	VDP		SIVDP<CR>
	TV		SITV<CR>
	DBS/SAT		SIDBS/SAT<CR>
	VCR-1		SIVCR-1<CR>
	VCR-2		SIVCR-2<CR>
	VCR-3		SIVCR-3<CR>
	V.AUX		SIV.AUX<CR>
	CDR/TAPE1	---Select CDR/TAPE function at AVR-4802R	SICDR/TAPE1<CR>
	MD/TAPE2	---Invalid at AVR-4802R	SIMD/TAPE2<CR>
ZM	ON	MAIN-ZONE ON/OFF change	ZMON<CR>
Z1	OFF		ZMOFF<CR>
	PHONO	MULTI ZONE-1 mode set , and select source	Z1PHONO<CR>
		---The name of PARAMETER is	
	MD/TAPE2	the same as that of the time of SI COMMAND.	Z1MD/TAPE2<CR>
	SOURCE	MULTI ZONE-1 mode cancel	Z1SOURCE<CR>
	UP	MULTI ZONE-1 VOLUME UP/DOWN , direct change to ***dB	Z1UP<CR>
	DOWN		Z1DOWN<CR>
	**	** : 00 to 99 by ASCII , 80=0dB, 99=--- (MIN)	Z180<CR>
	ON	MULTI ZONE-1 ON/OFF change	Z1ON<CR>
	OFF		Z1OFF<CR>
---Set MULTI ZONE functions at AVR-4802R			

COMMAND	PARAMETER	function	example
Z2	PHONO MD/TAPE2	MULTI ZONE-2 mode set , and select source ---The name of PARAMETER is the same as that of the time of SI COMMAND.	Z2PHONO<CR> Z2MD/TAPE2<CR>
	SOURCE	MULTI ZONE-2 mode cancel	Z2SOURCE<CR>
	UP	MULTI ZONE-2 VOLUME UP/DOWN , direct change to ***dB	Z2UP<CR>
	DOWN		Z2DOWN<CR>
	**		Z280<CR>
	ON	** : 00 to 99 by ASCII , 80=0dB	Z2ON<CR>
	OFF	MULTI ZONE-2 ON/OFF change	Z2OFF<CR>
	---Invalid at AVR-4802R		
SR	PHONO MD/TAPE2	REC SELECT mode set , and select source ---The name of PARAMETER is the same as that of the time of SI COMMAND.	SRPHONO<CR> SRMD/TAPE2<CR>
	SOURCE	REC SELECT mode cancel	SRSOURCE<CR>
	SV	DVD	VIDEO SELECT mode set , and select source
VDP		SVVDP<CR>	
TV		SVTV<CR>	
DBS/SAT		SVDBS/SAT<CR>	
VCR-1		SVVCR-1<CR>	
VCR-2		SVVCR-2<CR>	
VCR-3		SVVCR-3<CR>	
V.AUX		SVV.AUX<CR>	
SOURCE		VIDEO SELECT mode cancel	SVSOURCE<CR>
SD	AUTO	set DIGITAL INPUT AUTO mode	SDAUTO<CR>
	PCM	set DIGITAL INPUT force PCM mode	SDPCM<CR>
	DTS	set DIGITAL INPUT force DTS mode	SDDTS<CR>
	RF	set DIGITAL INPUT force RF mode	SDRF<CR>
	ANALOG	set force ANALOG INPUT mode	SDANALOG<CR>
	EXT.IN-1	set EXT.IN-1 mode ---Set EXT.IN mode at AVR-4802R	SDEXT.IN-1<CR>
	EXT.IN-2	set EXT.IN-2 mode ---Invalid at AVR-4802R	SDEXT.IN-2<CR>

EVENT	PARAMETER	function	example
MS	DIRECT	SURROUND mode set	MSDIRECT<CR>
	PURE DIRECT		MSPURE DIRECT<CR>
	STEREO		MSSTEREO<CR>
	MULTI CH IN		MSMULTI CH IN<CR>
	MULTI CH DIRECT		MSMULTI CH DIRECT<CR>
	MULTI CH PURE D		MSMULTI CH PURE D<CR>
	DOLBY PRO LOGIC	All are received as "DOLBY SURROUND" , the surround mode which changed return as EVENT .	MSDOLBY PRO LOGIC<CR>
	DOLBY PL2		MSDOLBY PL2<CR>
	DOLBY DIGITAL		MSDOLBY DIGITAL<CR>
	DOLBY D EX		MSDOLBY D EX<CR>
	6.1 SURROUND	Same as "DOLBY D EX"	MS6.1 SURROUND<CR>
	DTS NEO:6	All are received as "DTS SURROUND" , the surround mode which changed return as EVENT .	MSDTS NEO:6<CR>
	DTS SURROUND		MSDTS SURROUND<CR>
	DTS ES DSCRT6.1		MSDTS ES DSCRT6.1<CR>
	DTS ES MTRX6.1		MSDTS ES MTRX6.1<CR>
	HOME THX CINEMA	All are received as "THX SURROUND" , the surround mode which changed return as EVENT .	MSHOME THX CINEMA<CR>
	THX5.1		MSTHX5.1<CR>
	THX U2 CINEMA		MSTHX U2 CINEMA<CR>
	THX MUSIC MODE		MSTHX MUSIC MODE<CR>
	THX6.1	---Operate as Matrix6.1 or Discrete6.1	MSTHX6.1<CR>
	THX SURROUND EX		MSTHX SURROUND EX<CR>
	WIDE SCREEN		MSWIDE SCREEN<CR>
	5CH STEREO	Both are received as "5CH/7CH STEREO" , the surround mode which changed return as EVENT .	MS5CH STEREO<CR>
	7CH STEREO		MS7CH STEREO<CR>
	SUPER STADIUM		MSSUPER STADIUM<CR>
	ROCK ARENA		MSROCK ARENA<CR>
	JAZZ CLUB		MSJAZZ CLUB<CR>
	CLASSIC CONCERT		MSCCLASSIC CONCERT<CR>
	MONO MOVIE		MSMONO MOVIE<CR>
	MATRIX		MSMATRIX<CR>

EVENT	PARAMETER	function	example
PS	TONE DEFEAT ON	PARAMETER setting	PSTONE DEFEAT ON<CR>
	TONE DEFEAT OFF	TONE DEFEAT ON/OFF	PSTONE DEFEAT OFF<CR>
	SB:MTRX ON	SURROUND BACK SP MODE set	PSSB:MTRX ON<CR>
	SB:NON MTRX	---MTRX ON = SURR.EX ON = DSCRT ON = NRML	PSSB:NON MTRX<CR>
	SB:OFF	(@THX) (@ES DSCRT) (PL2, NEO6)	PSSB:OFF<CR>
	CINEMA EQ.ON	CINEMA EQ. ON/OFF	PSCINEMA EQ.ON<CR>
	CINEMA EQ.OFF		PSCINEMA EQ.OFF<CR>
	MODE : MUSIC	CINEMA / MUSIC /PL mode change	PSMODE : MUSIC<CR>
	MODE : CINEMA	(This parameter can change DOLBY PL2,NEO:6 mode.)	PSMODE : CINEMA<CR>
	MODE : EMULATION	---Invalid at AVR-4802R	PSMODE : EMULATION<CR>
	MODE : PRO LOGIC	--- EMU. & PL can change ONLY DOLBY PL2 mode.	PSMODE : PRO LOGIC<CR>
TF	UP	TUNER Frequency UP/DOWN , direct change	TFUP<CR> *
	DOWN		TFDOWN<CR> *
	***** (6 digits)	--- ****.* kHz at AM band (>050000 is AM.) ****.* MHz at FM band (<050000 is FM.)	TF105000<CR> (1050.00kHz at AM)
TP	UP	TUNER PRESET CH UP/DOWN , direct change to No.**	TPUP<CR>
	DOWN		TPDOWN<CR>
	**(PRESET No.)		TPA1<CR> (PRESET No."A1")
TM		TUNER BAND , MODE Select	
	AM	---Band set to AM	TMAM<CR>
	FM	---Band set to FM	TMFM<CR>
	AUTO	---Tuning mode set to AUTO mode	TMAUTO<CR> *
	MANUAL	---Tuning mode set to MANUAL mode	TMMANUAL<CR> *

TF, TP, TM **COMMAND** : '*' parameters can NOT operate when INPUT source isn't TUNER.

EVENT(or RESPONSE) and PARAMETER list

EVENT	PARAMETER	function	example	*RES.
PW	ON	POWER ON/STANDBY change	PWON<CR>	
	STANDBY		PWSTANDBY<CR>	
MV	**	MASTER VOLUME change , **:00 to 98 by ASCII 98 = +18dB(MAX) 80 = 0dB 10 = -70dB 99 = ---dB(MIN)	MV80<CR>	
CV	FL **	CHANNEL VOLUME change , **:38 to 62 by ASCII 62 = +12dB(MAX) 50 = 0dB 38 = -12dB(MIN) 00 = OFF (define ONLY SWch in DIRECT mode.)	CVFL 50<CR>	
	FR **		CVFR 50<CR>	
	C **		CVC 50<CR>	
	SW **		CVSW 50<CR>	
	SL **		CVSL 50<CR>	
	SR **		CVSR 50<CR>	
	SBL **		CVSBL 50<CR>	
	SBR **		CVSBR 50<CR>	
	SB **		CVSB 50<CR>	
MU	ON	OUTPUT MUTE ON/OFF change	MUON<CR>	
	OFF		MUOFF<CR>	
SI	PHONO	INPUT source change	SIPHONO<CR>	
	CD		SICD<CR>	
	TUNER		SITUNER<CR>	
	DVD		SIDVD<CR>	
	VDP		SIVDP<CR>	
	TV		SITV<CR>	
	DBS/SAT		SIDBS/SAT<CR>	
	VCR-1		SIVCR-1<CR>	
	VCR-2		SIVCR-2<CR>	
	VCR-3		SIVCR-3<CR>	
	V.AUX		SIV.AUX<CR>	
	CDR/TAPE1		SICDR/TAPE1<CR>	
	MD/TAPE2		SIMD/TAPE2<CR>	
		---means CDR/TAPE function at AVR-4802R		
		---Invalid at AVR-4802R		

RES. : NOT returns '' parameters as **RESPONSE**.

EVENT	PARAMETER	function	example	*RES.
ZM	ON	MAIN-ZONE ON/OFF change	ZMON<CR>	
	OFF		ZMOFF<CR>	
Z1	PHONO	MULTI ZONE-1 source change ---The name of PARAMETER is the same as that of the time of SI COMMAND.	Z1PHONO<CR>	
	 MD/TAPE2		 Z1MD/TAPE2<CR>	
	SOURCE	MULTI ZONE-1 mode cancel	Z1SOURCE<CR>	
	**	MULTI ZONE-1 VOLUME change , **:00 to 99 by ASCII 98 = +18dB(MAX) 80 = 0dB 10 = -70dB 99 = --- (MIN)	Z180<CR>	
	ON	MULTI ZONE-1 ON/OFF change	Z1ON<CR>	
	OFF		Z1OFF<CR>	
	---means MULTI ZONE functions at AVR-4802			
Z2	PHONO	MULTI ZONE-2 source change ---The name of PARAMETER is the same as that of the time of SI COMMAND.	Z2PHONO<CR>	
	 MD/TAPE2		 Z2MD/TAPE2<CR>	
	SOURCE	MULTI ZONE-2 mode cancel	Z2SOURCE<CR>	
	**	MULTI ZONE-2 VOLUME change , **:00 to 99 by ASCII 98= +18dB(MAX) 80 = 0dB 10 = -70dB 99 = --- (MIN)	Z180<CR>	
	ON	MULTI ZONE-2 ON/OFF change	Z2ON<CR>	
	OFF		Z2OFF<CR>	
	---Invalid at AVR-4802R			
SR	PHONO	REC SELECT source change ---The name of PARAMETER is the same as that of the time of SI COMMAND.	SRPHONO<CR>	
	 MD/TAPE2		 SRMD/TAPE2<CR>	
	SOURCE	REC SELECT mode cancel	SRSOURCE<CR>	

<i>EVENT</i>	<i>PARAMETER</i>	function	example	*RES.
TF	***** (6 digits)	TUNER Frequency change --- *****.** kHz at AM band ****.** MHz at FM band	TF105000<CR> (1050.00kHz at AM)	
TP	**(PRESET No.)	TUNER PRESET change to No.**	TPA1<CR> (PRESET No. "A1")	
TM	AM	TUNER BAND , MODE change ---Band set to AM	TMAM<CR>	
	FM	---Band set to FM	TMFM<CR>	
	AUTO	---Tuning mode set to AUTO mode	TMAUTO<CR>	
	MANUAL	---Tuning mode set to MANUAL mode	TMMANUAL<CR>	

EVENT	PARAMETER	function	example	*RES.
MS	DIRECT	SURROUND mode change	MSDIRECT<CR>	
	PURE DIRECT		MSPURE DIRECT<CR>	
	STEREO		MSSTEREO<CR>	
	MULTI CH IN		MSMULTI CH IN<CR>	
	MULTI CH DIRECT		MSMULTI CH DIRECT<CR>	
	MULTI CH PURE D		MSMULTI CH PURE D<CR>	
	DOLBY PRO LOGIC		MSDOLBY PRO LOGIC<CR>	
	DOLBY PL2		MSDOLBY PL2<CR>	
	DOLBY DIGITAL		MSDOLBY DIGITAL<CR>	
	DOLBY D EX		MSDOLBY D EX<CR>	
	6.1 SURROUND		MS6.1 SURROUND<CR>	
	DTS NEO:6		MSDTS NEO:6<CR>	
	DTS SURROUND		MSDTS SURROUND<CR>	
	DTS ES DSCRT6.1		MSDTS ES DSCRT6.1<CR>	
	DTS ES MTRX6.1		MSDTS ES MTRX6.1<CR>	
	HOME THX CINEMA		MSHOME THX CINEMA<CR>	
	THX5.1		MSTHX5.1<CR>	
	THX U2 CINEMA		MSTHX U2 CINEMA<CR>	
	THX MUSIC MODE		MSTHX MUSIC MODE<CR>	
	THX6.1		MSTHX6.1<CR>	
	THX SURROUND EX WIDE SCREEN		MSTHX SURROUND EX<CR> MSWIDE SCREEN<CR>	
	5CH STEREO		MS5CH STEREO<CR>	
	7CH STEREO		MS7CH STEREO<CR>	
	SUPER STADIUM		MSSUPER STADIUM<CR>	
	ROCK ARENA		MSROCK ARENA<CR>	
	JAZZ CLUB		MSJAZZ CLUB<CR>	
	CLASSIC CONCERT		MSCCLASSIC CONCERT<CR>	
	MONO MOVIE		MSMONO MOVIE<CR>	
	MATRIX		MSMATRIX<CR>	